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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,339	03/27/2001	Yoshihiro Hama	P20338	8905

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EXAMINER	
PHAM, HAI CHI	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/817,339	HAMA ET AL.	
	Examiner	Art Unit	
	Hai C. Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 15-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 15-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 03/08/05 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of U.S. Patent No. 6,636,340 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1, 15 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Maruyama (U.S. 6,346,957).

Maruyama discloses a multi-beam scanning apparatus comprising a light source (25) emitting a plurality of light beams, a single polygon mirror (29), an optical system including a common set of first and second f-θ lenses (30) and a plurality of optical path turning systems for turning optical paths of the deflected light beams, respectively, each of the plural optical path turning systems including an even and equal number of reflecting surfaces (formed by the separating mirror 31 and each of the respective mirrors 232a-232d) (Fig. 14A), toward the surface to be scanned of the photoreceptor drums (24a-24d), wherein the optical path lengths of the optical paths of the respective deflected light beams are kept equal to one another (col. 4, lines 55-59 and col. 7, lines 1-6) such that similar size spots are obtained on each photoreceptor, and wherein each of the optical path turning systems reflect the deflected light beam an even number of times, e.g., twice.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Tanaka et al (U.S. 6,473,105).

Maruyama discloses all the basic limitations of the claimed invention except for the third f-θ lens, one of the optical paths having a third optical path passing between

the polygon mirror and the first lens, and the third optical path intersecting the first optical path, and the beam proceeding along the second optical path being directed on an opposite side, with respect to the first optical path, of said objects to be scanned.

Tanaka et al. discloses an optical scanning apparatus (Fig. 2) including a light source emitting plural light beams, a common polygon mirror (220) for deflecting the plural light beams, which pass through the common first and second fΠ lenses (230 and 240) before being deflected by sets or mirrors (26) toward the respective third fΠ lenses (251-254) to scan the respective photosensitive drums (21-24). Tanaka et al. further teaches one the optical path of the light beam scanning the closest photosensitive drum (21) having a third optical path passing between the polygon mirror and the first lens (230), and at least the third optical path intersecting the first optical path with the second optical path being directed on an opposite side, with respect to the first optical path, of the photosensitive drum.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Maruyama with the third fΠ lens and to rearrange the positions of the reflecting mirrors such that the reflecting second optical path is directed away from the drum and the third optical path intersecting the first optical path as taught by Tanaka et al. The motivation for doing so would have been to provide a more compact configuration of the optical scanning system and at the same time a compensation system for correcting the wobble of the polygon mirror.

With regard to claims 5-7, Maruyama further teaches the reflecting surfaces being provided with sets of reflecting mirrors or prisms.

3. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Tanaka et al., as applied to claims 1-4 above, and further in view of Kamikubo (U.S. 6,115,164).

Maruyama, as modified by Tanaka et al., discloses all the basic limitations of the claimed invention except for the refractive power characteristics of the f-θ lenses.

Kamikubo discloses a scanning optical system in which the f- θ lenses include a first imaging lens (21), a second imaging lens (22) and a third imaging lens (30), wherein the first and the second imaging lenses have positive power in the main scanning direction while the third imaging lens has a strong positive power in the auxiliary scanning direction such that the balance of the refractive power of the imaging lenses as a whole is maintained (col. 4, lines 40-62).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the set of imaging lenses of the modified device of Maruyama having the refractive power characteristics as taught by Kamikubo such that the light beam passing through the set of imaging lenses is properly converged in both the main and auxiliary scanning directions to form a beam spot on the surface to be scanned.

4. Alternatively, claims 2-3 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Koide (U.S. 5,181,137).

Maruyama discloses all the basic limitations of the claimed invention except for the third set of lenses, and the image plane being parallel to the deflected light beams.

Koide, an acknowledged prior art, discloses a light scanning apparatus for scanning a multiple photoreceptors (50-53) disposed on one side of the single polygon mirror (2) and located at different distances from the polygon mirror, the system including a light source emitting a plurality of light beams, which are deflected by the common rotating polygon mirror, all the deflected plural light beams passing through a common pair of f-θ lenses (3a and 3b) before being reflected by the respective sets of reflecting mirrors of an equal number (130-133), wherein each of the reflected light beam passes through a respective third lens (40-43) to be focused on the surface of the respective photoreceptors, an wherein the image plane at the respective photoreceptors is parallel to the respective deflected light beam (Fig. 4).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a third focusing lens system in the device of Maruyama as taught by Koide. The motivation for doing so would have been to correct the bending as well as the focusing of the scan lines on the respective image planes as suggested by Koide. It would also have been obvious at the time the invention was made to a person having ordinary skill in the art to rearrange to image planes in the device of Maruyama as taught by Koide since such a modification would have involved a mere change in the position of components, which would not have modified the operation of the device. A change of position is generally recognized as being within the level of ordinary skill in the art. In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

5. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Koide, as applied to claim 3 above, and further in view of Wang (U.S. 6,219,168).

Maruyama, as modified by Koide, discloses all the basic limitations of the claimed invention except for the third optical located closest to the polygon mirror passing between the polygon mirror and the first lens, and the third optical path intersecting the first optical path.

Wang discloses in Figure 7 a raster output scanning system (330) for scanning a multiple photoreceptors (340, 346, 352 and 358) disposed on one side of the single polygon mirror (300) and located at different distances from the polygon mirror, the system including a light source emitting a plurality of light beams, which are deflected by the common rotating polygon mirror, all the deflected plural light beams passing through a common pair of f-θ lenses (332 and 334) before being deflected by the respective sets of mirrors, each set having an even number of reflecting mirrors (336-338, 342-344, 348-350 and 354-356), onto the surface of the respective photoreceptors. Wang further teach the third optical path intersecting the first optical path.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to rearrange the image plane such that the third optical path intersecting the first optical path in the device of Maruyama as taught by Wang for the purpose of rendering the optical scanning system more compact. It would also have been obvious at the time the invention was made to a person having ordinary skill in the

art to have the third optical located closest to the polygon mirror passing between the polygon mirror and the first lens in Maruyama device since such a modification would have involved a mere change in the position of components, which would not have modified the operation of the device. A change of position is generally recognized as being within the level of ordinary skill in the art. In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

6. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama in view of Koide and Wang, as applied to claim 4 above, and further in view of Kamikubo.

Maruyama, as modified by Koide and Wang, discloses all the basic limitations of the claimed invention except for the refractive power characteristics of the f-θ lenses.

Kamikubo discloses a scanning optical system in which the f- θ lenses include a first imaging lens (21), a second imaging lens (22) and a third imaging lens (30), wherein the first and the second imaging lenses have positive power in the main scanning direction while the third imaging lens has a strong positive power in the auxiliary scanning direction such that the balance of the refractive power of the imaging lenses as a whole is maintained (col. 4, lines 40-62).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the set of imaging lenses of the modified device of Maruyama having the refractive power characteristics as taught by Kamikubo such that the light beam passing through the set of imaging lenses is properly

converged in both the main and auxiliary scanning directions to form a beam spot on the surface to be scanned.

Response to Arguments

7. Applicant's arguments filed 03/08/05 have been fully considered but they are not persuasive.

Applicant argued that the attribute related to keeping the optical path lengths equal only applies to the first embodiment as shown in Fig. 1 of Maruyama, and that such attribute would not applicable to different embodiments disclosed by Maruyama. The examiner respectfully disagrees. Maruyama discloses variations in the optical scanning device related only to the number and structure of the reflecting surfaces (Fig. 1, 12 and 14A-14C), and wherein the preferred condition or arrangement of the reflecting surfaces would keep the optical path lengths equal independent of any structure or number of the reflecting surfaces.

Applicant further argued that "Tanaka is not a valid prior art reference" based on the prior art filing date as compared to the filing date of Applicant's foreign priority document. The examiner suggests overcoming this provisional rejection in the following way: Perfecting a claim to priority under 35 U.S.C. 119 that antedates the reference by filing a certified priority document in the application that satisfies the enablement and description requirements of 35 U.S.C. 112, first paragraph, establishing that the prior application satisfies the enablement and description requirements of 35

U.S.C. 112, first paragraph. Until such procedure is formalized, the rejection of claims based on the prior art in Tanaka remains effective.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hai Chi Pham

HAI PHAM
PRIMARY EXAMINER

May 24, 2005